PROCEEDINGS

OF THE

CALIFORNIA ACADEMY OF SCIENCES

FOURTH SERIES

VOL. XII, No. 15, pp. 319–340, text figures 1 to 13. JULY 21, 1923

XV

EXPEDITION OF THE CALIFORNIA ACADEMY OF SCIENCES TO THE GULF OF CALIFORNIA IN 1921[1]

THE DERMAPTERA AND ORTHOPTERA

BY

MORGAN HEBARD

Philadelphia, Pa.

The Dermaptera and Orthoptera secured on the California Academy of Sciences' 1921 Expedition to the Gulf of California are recorded in the present paper. To these records have been added the few unpublished which are available since the appearance of the Biologia Centrali-Americana, 1893 to 1908. All of the material was collected by Mr. E. P. Van Duzee and in the year 1921, unless otherwise stated. This belongs to the California Academy of Sciences, the few exceptions being so specified. The author has been permitted to retain a second set.

The expedition covered a period preceding that of the appearance in greatest adult number of the Orthoptera. Though the region is undoubtedly not rich in this order; that fact largely explains why a somewhat larger number of species was not secured.

A total of 329 specimens was taken, distributed as follows:

[1]A map showing all the islands, etc., visited by this Expedition will be found in Vol. XII, No. 6, of these Proceedings, copies of which can be supplied at nominal cost.

MEASUREMENTS (IN MILLIMETERS)

	Genera	Species	New Species	Species known from the United States	Species peculiar to the regions about the Gulf of California
Dermaptera	2	2	0	2	0
Orthoptera					
Blattidæ	5	6	0	3	2
Mantidæ	1	1	0	1	0
Phasmidæ	1	1	0	1	0
Acrididæ	14	15	1	11	4
Tettigoniidæ	5	5	3	1	3
Gryllidæ	5	5	0	4	1
	33	35	4	23	10

We take the present opportunity to express our hearty thanks to Mr. E. P. Van Duzee and Dr. Barton Warren Evermann for the privilege of studying this collection, secured largely at exceptionally inaccessible and little known localities.

DERMAPTERA

1. **Euborellia annulipes** (Lucas)

Mulegé, Lower California, May 14, 1921, 1 ♀.

This is one of the rare individuals of the species in which neither antennæ nor limbs are annulate. In proportions and all structural characters it agrees fully with typical individuals before us from the state of Sinaloa.

The insect has a wide, though apparently discontinuous distribution through warmer temperate and tropical North America. It has probably been introduced by commerce at many localities where it is now established.

2. **Spongovostox apicedentatus** (Caudell)

Patos Island, Sonora, Gulf of California, April 23, 1921, 1 ♂, 2 ♀; Guaymas, Sonora, Mexico, April 14, 1921, (J. C. Chamberlin), 2 ♂, 1 ♀. Mejia Island, Gulf of California, April 30, (J. C. Chamberlin), 3 ♂. Angeles Bay, Lower California, June 27, (J. C. Chamberlin), 2 ♀. Isla Partida, Gulf of California, April 22, 1 ♂, 4 ♀, 4 juv.; Tortuga Island, Gulf of California, May 11 (J. C. Chamberlin), 1 ♀. Puerto

Ballandra, Carmen Island, Gulf of California, May 21, 5 ♀. Monserrate Island, Gulf of California, May 25, 1 juv. Santa Catalina Island, Gulf of California, June 12, (J. C. Chamberlin), 3 ♀, 1 juv. Ceralbo Island, Gulf of California, June 6, 3 ♀, 1 juv.

This species has been recorded in the United States from the Gulf of Mexico westward to Fort Yuma, California. The above are the first records for Mexico, in the northern portion of which country *apicedentatus* probably has a very extensive distribution.

Orthoptera

Blattidæ

3. **Blattella germanica** (Linnæus)

Guaymas, Sonora, Mexico, April 15, 1 ♂.

This species is a domiciliary pest, which has been carried by commerce around the world.

4. **Periplaneta americana** (Linnæus)

Guaymas, Sonora, Mexico, April 7, 1 ♀. Angeles Bay, Lower California, May 4 and 5, (Van Duzee and Chamberlin), 1 ♀, 4 juv.

This large cockroach is also a domiciliary insect, widely distributed by commerce and apparently most generally established in warmer temperate and tropical North America.

5. **Panchlora montezuma** Saussure & Zehntner

Guaymas, Sonora, Mexico, April 14, (J. C. Chamberlin), 3 ♀, 3 very small juv.; San José Island, Gulf of California, May 28, 3 ♂, 2 ♀, 2 juv. ♀; Ceralbo Island, Gulf of California, June 6, 3 ♀, 1 juv.

The females from Ceralbo Island are unusually small, no larger than the average males. This distinctive species has never been found except on the shores of the Gulf of California.

6. **Arenivaga rehni** Hebard

Angeles Bay, Lower California, May 4, 2 ♂ ; Las Animas Bay, Lower California, May 8, (J. C. Chamberlin), 1 ♀ ; Arroyo Gua, near Loreto, Lower California, May 20, (J. C. Chamberlin), 1 ♀ ; Puerto Ballandra, Carmen Island, Gulf of California, May 22, (V. Owen), 1 juv. ♂, 4 small juv., 1 ootheca; East Las Galeras Island, Gulf of California, June 13, 1 ♀, 1 small juv.; Ceralbo Island, Gulf of California, June 7, 1 small juv.

This species is known only from Lower California.

7. **Arenivaga erratica** Rehn

Angeles Bay, Lower California, June 26, 4 ♂.

These specimens have the tegmina and wings very diaphanous, approaching the normal condition found in *Eremoblatta subdiaphana* (Scudder). Such individuals are represented in the large series before us from the United States only by males from San Diego and Cottonwood, Mojave Desert, California.

Widely distributed over the southwestern United States, this species has previously been recorded from Mexico only from the state of Durango.

8. **Chorisoneura flavipennis** Saussure & Zehntner

Espiritu Santo Island, Gulf of California, June 1, 1 ♀.

This insect has not been recorded since the original description of material from Atoyac, Vera Cruz, Mexico.

MANTIDÆ

9. **Litaneutria ocularis** Saussure

Pond Island Bay, Angel de la Guardia Island, Gulf of California, June 30, 1 ♂ ; Angeles Bay, Lower California, June 26, 1 ♂.

Confusion, caused by subsequent description by Scudder of several doubtful species from the United States, prevents accurate delimiting of the range of this species at the present time. It probably enjoys a wide distribution over the southwestern United States and northern Mexico.

PHASMIDÆ

10. **Pseudosermyle arbuscula** (Rehn)

Angeles Bay, Lower California, May 5, 1 juv. ♀.

This species has not been recorded since the original description of material from San Diego, California.

ACRIDIDÆ

11. **Paratettix hesperus** Morse

Escondido Bay, Lower California, June 14, (J. C. Chamberlin), 1 ♀ ; San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 1 ♀, [Leland Stanford Jr. Univ].

Known on the Pacific Coast from Washington to the Mexican border, the above material is the first to be recorded from Mexico. The San Antonio specimen shows an approach toward *Paratettix aztecus* (Saussure).

12. **Psoloessa texana** Scudder

Guaymas, Sonora, Mexico, April 9 and 14, 1 ♂, 2 ♀ ; Ildefonso Island, Gulf of California, May 17, (V. Owen), 1 juv. ♀ ; San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 6 ♂, 1 ♀, [Leland Stanford Jr. Univ.] ; July 12 to 17, 1919, (J. R. Slevin), 2 ♂, 1 ♀.

The females have the vertex narrower than is usual in Arizona material, but variable in form. The vertex is found to exhibit decided individual variation in this species. This is probably one of the most abundant grasshoppers over the greater portion of the southwestern United States and northern Mexico.

13. **Scyllina viatoria** (Saussure)

San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 8 ♂, 4 ♀, [Leland Stanford Jr. Univ.] ; July 12 to 17, 1919, (J. R. Slevin), 5 ♂, 1 ♀.

In the United States this insect is known from the vicinity of Tucson, Arizona, to the Mexican border.

14. **Leprus glaucipennis** Scudder

San Antonio, Distrito Sur, Lower California, 1200 feet July 15, 1919, (G. F. Ferris), 2 ♂, 1 ♀, [Leland Stanford Jr. Univ.]; July 12 to 17, 1919, (J. R. Slevin), 1 ♂.

This handsome insect is known from coastal California as far north as the region of Los Angeles. It has been recorded from Mexico from Durango, San Luis Potosi and Hermosillo, Sonora.

15. **Lactista gibbosus** Saussure

Tortuga Island, Gulf of California, May 11 and June 22, 2 ♂, 2 ♀; South Santa Inez Island, Gulf of California, May 13, 1 ♀; San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 12 ♂, 7 ♀, [Leland Stanford Jr. Univ.]; July 12 to 17, 1919, (J. R. Slevin), 6 ♀.

In the United States this insect is known only from the region of Los Angeles to Tia Juana, in California. In Mexico it has been recorded from Lower California and Sinaloa.

16. **Tomonotus ferruginosus** Bruner

San Pedro Bay, Sonora, Mexico, July 7, (V. Owen), 1 ♀.

Though proportionately somewhat less heavy and more elongate than paratypic females of *ferruginosus,* the weaker caudal production of the pronotal disk shows a tendency toward the normal type of *T. mexicanus* Saussure. The coloration of this specimen is cinnamon, shading to rufous. The wings have the disk bittersweet orange (richer and with a slightly greater tincture of pink than in typical *ferruginosus).* The caudal tibiæ are pale glaucous, with proximal portion buffy. The ventral and internal surfaces of the caudal femora are dark, except for the distal portion and a transverse postmedian band of buff. Length of body 29.8, length of pronotum 8, length of tegmen 27.2, length of caudal femur 16.3 mm.

Known from a small area in southern Arizona and "California," the present specimen is the first of the species to be recorded from Mexican territory.

17. **Trimerotropis vinculata** Scudder

San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 1 ♂.

This is one of the most abundant and widely distributed species of the western United States. It has been recorded, as *T. pallidipennis* (Burmeister), from numerous localities in Mexico and as *vinculata* from the state of Chihuahua.

18. **Trimerotropis** sp.

San Pedro Nolasco Island, Sonora, Gulf of California, April 17, 1 ♀.

This same species has been reported from San Diego, California, as *Trimerotropis rebellis* Saussure, but this assignment appears to be questionable. The insect can not be definitely located until the genus has been fully revised.

19. **Anconia integra** Scudder

Patos Island, Gulf of California, April 23, 1 ♂, (grayish); San Pedro Bay, Sonora, Mexico, July 7, (V. Owen), 1 ♀, (green); San Luis Gonzales Bay, Lower California, April 28, 1 ♂, 1 ♀, (brownish gray); Puerto Refugio, Angel de la Guardia Island, Gulf of California, June 29, 1 ♀, (brownish gray); Angeles Bay, Lower California, May 7, 1 ♂, (grayish); Isla Raza, Gulf of California, May 4, 1 ♀, (grayish); Tortuga Island, Gulf of California, May 11, 2 ♀, (brownish gray); Mejia Island, Gulf of California, June 28, 1 ♀, (pale brownish gray).

Known from Tucson, Arizona, and southern Nevada to the Mojave Desert in the United States, the species has not been recorded previously from Mexico.

20. **Heliastus californicus** (Thomas)

Patos Island, Sonora, Gulf of California, April 23, 1 juv. ♀; San Pedro Bay, Sonora, Mexico, July 7, (V. Owen), 1 ♀; Guaymas, Sonora, Mexico, April 7 to 14, 3 ♂, 4 juv. ♀; San Luis Gonzales Bay, Lower California, April 28, 2 juv. ♀; Mejia Island, Gulf of California, April 30 and June 28, 2 ♂; Puerto Refugio, Angel de la Guardia Island,

Gulf of California, May 1, (J. C. Chamberlin), 1 juv. ♂, 1 juv. ♀ ; Palm Cañon, Angel de la Guardia Island, Gulf of California, May 3, (J. C. Chamberlin), 1 ♀ ; Pond Island Bay, Angel de la Guardia Island, Gulf of California, June 30, 1 ♀ ; Angeles Bay, Lower California, May 4 to June 26, (Chamberlin and Van Duzee), 2 ♂, 1 ♀ ; San Francisquito Bay, Lower California, May 10, 1 ♀ ; San Marcos Island, Gulf of California, May 12, 1 ♂ ; Santa Inez Island, Gulf of California, May 13, 2 ♀ ; Mulegé, Lower California, May 15, 1 ♂ ; Coronados Island, Gulf of California, May 18, 1 juv. ♀ ; Loreto, Lower California, May 19 and 20, 1 ♂, 3 ♀, 1 juv. ♀ ; Monserrate Island, Gulf of California, May 24, 1 ♂ ; Agua Verde, Lower California, May 28, 1 ♂ ; San Francisco Island, Gulf of California, May 30, 3 ♂, (small) ; Ceralbo Island, Gulf of California, June 6, 2 ♀, 1 juv. ♀, (small) ; San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 10 ♂, 10 ♀ ; July 12 to 17, 1919, (G. R. Slevin), 3 ♂, 6 ♀.

This species is widely distributed over the southwestern United States. It appears generally in the literature as *Heliastus aridus* (Bruner) and until this genus has been thoroughly revised, the number of species and proper names to use can not be definitely stated. In Mexico, *aridus* has only been recorded from Tepic, though in the northern part of that country it probably has a very extensive range.

21. **Calamacris mexicanus** Bruner

San Francisquito Bay, Lower California, May 10, 1 large juv. ♂ ; Coronados Island, Gulf of California, May 18, 1 juv. ♂, 1 juv. ♀ ; Loreto, Lower California, May 19 and 20, 2 large juv. ♀ ; Danzante Island, Gulf of California, May 24, 1 juv. ♀.

This interesting species was previously known only from the unique type, taken at Patrocino, Lower California.

22. **Litoscirtus insularis** Bruner

Turtle Bay, Lower California, 1 ♀.

Like the material originally described, this species was preserved in alcohol and is in poor condition. The type lo-

cality is Cedros Island, Lower California; a female was also recorded, however, from Central America, that locality probably in error.

23. **Clematodes vanduzeei** Hebard, new species

Figs. 1 and 2 p. 329

This insect is closely related to the genotype, *C. larreæ* Scudder, described from Mesilla, New Mexico, and subsequently recorded from Lerdo, Durango and Camacho, Zacatecas, Mexico. The genus is near the Vilernæ, belonging to the subfamily Cyrtacanthacrinæ, though in many respects surprisingly resembling the Pyrgomorphid genus Calamacris.

The female before us, in the instar preceding maturity, when compared with the females of *larreæ,* is found to differ in the more elongate vertex, with apical portion of dorsal surface proportionately more ample (as figured), the numerous longitudinal carinæ of the pronotum are weaker, but the lateral carinæ of the disk show a minute tubercle, projecting more than any other, while the caudal femora are longer, with dorsal genicular lobes decidedly more produced.

Type: Female, in instar preceding maturity, No. 1240, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, July 7, 1921, at **San Pedro Bay, Gulf of California.**

Compared with *larreæ* the present species agrees closely in the majority of features. The following, in addition to those given above, are noteworthy: Size slightly larger, form apparently slightly more slender; vertex projecting beyond the eye by distinctly more than the ocular width; lateral foveolæ facing dorso-laterad, as in *larreæ,* but larger; medio-longitudinal carina strong on occiput, obsolete proximad but fine and distinct distad on vertex, as in that species; eyes more elongate; pronotum with caudal margin broadly convex in lateral portions, these meeting meso-dorsad to form a very broad, obtuse-angulate emargination; ventral margin of lateral lobes broadly convex (these features as in *larreæ,* but not clearly stated in the original description); prosternal spine very blunt, truncate, almost strongly rounded quadrate (in the Lerdo female of *larreæ,* however, this spine is much blunter than in the others and is probably subject to decided individual variation in

the species of *Clematodes).* Mesosternal lobes slightly longer than wide, separated by less than their width as in *larreæ* (though given by Scudder as subquadrate, separated by their own width). Small, vestigial tegminal and wing pads present. Dorsal genicular lobes of caudal femora equally produced, slightly longer than basal width (slightly shorter than that dimension in *larreæ),* triangular with apices well rounded.

Length of body 26.8, length of vertex 1.8[1], length of antenna 7.4, length of pronotum 4.8, total cephalic width of pronotum 3.3, total caudal width of pronotum 4.1, length of caudal femur 15.8 mm.

General coloration, walnut brown, much overlaid with grayish and showing longitudinal, very slender streaks of dark brown; face with a broad, transverse bar of grayish, margined broadly above and below with a blackish suffusion; caudal femora with narrow and deeply concave ventral surface ferruginous.

The type is unique.

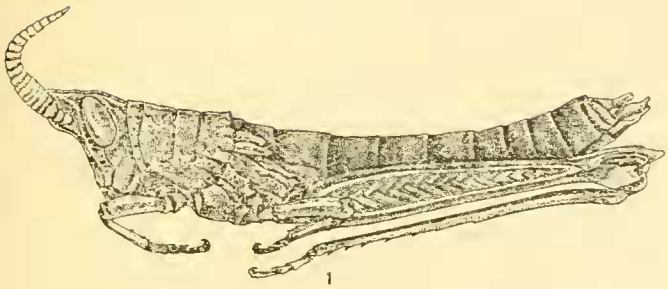
EXPLANATION OF FIGURES

Fig. 1, Clematodes vanduzeei Hebard, n. sp., immature female, type, lateral view, x 3. Fig. 2, same, dorsal view of vertex, x 10.5. Fig. 3, Œdomerus corallipes Bruner, male, lateral view of cercus, much enlarged. Fig. 4, Insara psaronota Hebard, n. sp., male, type, dorsal outline of pronotal disk, x 3. Fig. 5, same, dorsal view of apex of abdomen and cerci, x 9. Fig. 6, Microcentrum suave Hebard, n. sp., male, type, lateral outline of tegmen, natural size. Fig. 7, same, dorsal view of cercus, much enlarged. Fig. 7a, apex of same in lateral aspect, same scale. Fig. 8, same, ventral outline of subgenital plate, same scale as fig. 7. Fig. 9, same, female, allotype, lateral view of subgenital plate and ovipositor, x 5. Fig. 10, Eremopedes spinosa Hebard, n. sp., male type, lateral outline of pronotum, x 2.5. Fig. 11, same, dorsal view of ultimate tergite, x 6. Fig. 12, same, dorsal view of cercus, much enlarged. Fig. 13, same, female, allotype, lateral view of subgenital plate and ovipositor, x 1.5.

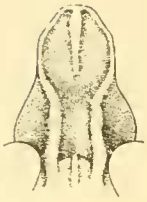
24. Schistocerca vaga Scudder

Patos Island, Sonora, Gulf of California, April 23, 4 ♀; San Pedro Marti Island, Gulf of California, April 18, 2 ♂, (one very pale); San Pedro Nolasco Island, Gulf of California, April 17, 1 ♀; San Pedro Bay, Sonora, Gulf of California, July 7, 1 ♂, 1 ♀; Guaymas, Sonora, Mexico, April 7

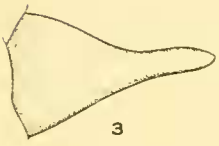
[1] In the females of *larreæ* before us this dimension is 1.2 to 1.3 mm.



1

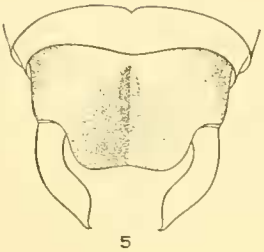


2

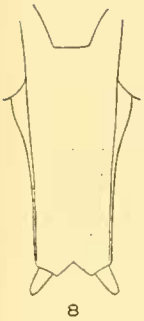


3

4



5



8

6

10

11

12

7

7A

9

13

to 15, 2 ♂, 1 ♀; Pond Island Bay, Angel de la Guardia Island, Gulf of California, July 1, 1 ♀; Isla Partida, Gulf of California, April 22, 2 ♀, (very pale); Tortuga Island, Gulf of California, May 11, 1 ♀; June 22, (J. C. Chamberlin), 1 ♀; San Marcos Island, Gulf of California, June 19, 2 ♀; Mulegé Lower California, May 14 and 15, 2 ♂; San Diego Island, Gulf of California, May 27, (J. R. Slevin), 1 ♀; Espiritu Santo Island, Gulf of California, May 31, 2 ♀, (one very pale); San Antonio, Distrito Sur, Lower California, July 15, 1919, (G. F. Ferris), 3 ♀ [Leland Stanford Jr. Univ.]; July 12 to 17, 1919, (J. R. Slevin), 3 ♂.

This powerfully flying grasshopper is widely distributed over the southwestern United States. It has been recorded from a number of localities in Mexico and from as far south as Realejo, Nicaragua.

Œdomerus Bruner

After careful comparison with the South American genus Sitalces and its relatives, with the North American genera related to Dactylotum and with the North American genus Phaulotettix of the Group Melanopli, we are convinced that much the nearest affinity is with Phaulotettix.

The genus violates the usually accepted rule that the Melanopli have the dorso-external margin of the caudal tibiæ armed with never less than eight spines, for in *O. corallipes* the number of such spines is six or seven. Similar reduction in number of spines is found in Sitalces, but there are species of that genus having as many as eight such spines and we do not believe this feature can be used as a group character. The large eyes, with interocular space resultantly very narrow, and form of vertex, resembles species of both Sitalces and Phaulotettix, agreeing with the latter more closely in having the eyes less projecting laterad. The general form is decidedly more Melanoploid.

We therefore remove the genus from the position assigned it by Bruner, near Sitalces, and transfer it to the Group Melanopli, where it is placed after the genus Sinaloa and before the genus Phaulotettix.

Compared with Phaulotettix, males are separable by the absence of furcula, styliform cerci and much smaller, conical subgenital plate. Females have the ovipositor valves much shorter, in normal position with apices alone projecting. Both sexes are separable from that genus by the proportionately larger eyes, pronotum with shorter metazona and with disk curving more evenly into the lateral lobes, prosternal spine which is low and blunt, narrower tegmina and cephalic and median femora, which have the cephalic ventral genicular angle very strongly and roundly produced (much more so than the caudal ventral genicular angle).

We consider the following characters of generic diagnostic value: Form stout, agreeing closely with that of Phaulotettix; head with eyes very large, but not very strongly projecting; pronotum expanding moderately caudad, with disk not produced caudad, its caudal margin very broadly obtuse-angulate concave, prozona nearly three times as long as metazona; tegmina small, lateral, narrowly elongate-oval pads; tympana present; male furcula absent; male cerci simple, moderately elongate, styliform, tapering to the acute apex; lateral margins of male subgenital plate not abruptly ampliate near base; caudal femora short and stout.

25. Œdomerus corallipes Bruner

Fig. 3, p. 329

1908. *Œdomerus corallipes* Bruner, Biol. Cent. Amer., Orth., II, p. 293, pl. IV, figs. 10, 10a, 14 and 14a. [♀; San José del Cabo, Lower California].

1908. *Œdomerus nigropleurus* Bruner, Ibid., p. 294. [♂; Cape St. Lucas, Lower California].

Guaymas, Sonora, Mexico, April 7 to 15, 1 ♂, 3 ♀, 1 juv. ♀; Mejia Island, Gulf of California, April 30, (J. C. Chamberlin), 1 juv. ♂; June 23, 1 ♀; Santa Inez Island, Gulf of California, May 13, 1 juv. ♀, 1 juv. ♀; Santa Cruz Island, Gulf of California, May 27, 1 ♂, 1 large juv. ♂; Espiritu Santo Island, Gulf of California, June 9, 1 ♂, 1 juv. ♀; La Paz, Lower California, June 3, 2 ♀; Cape St. Lucas, Lower California, (from Uhler Collection), 1 ♂

(type of *nigropleurus),* 3 ♀, 1 juv. ♂, 2 juv. ♀, [Mus. Comp. Zool., Acad. Nat. Sci. Phila. and Hebard Cln.].

The series, upon a male from which *nigropleurus* was described by Bruner, shows conclusively the synonymy indicated above. Large lateral dark areas are developed to different degrees in this material. This feature is a striking color variation, but nothing more.

Contrastingly colored individuals before us show a color pattern closely resembling that developed in *Phaulotettix eurycercus* Hebard. The majority of the series, however, have this pattern almost obsolete. The even curvature of the pronotum, added to the plainess of coloration, gives such individuals some resemblance to females of *Netrosoma nigropleura* Scudder. Closer examination, however, shows the resemblance to be wholly superficial.

MEASUREMENTS (IN MILLIMETERS)

♂	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur	Width of caudal femur
Guaymas, Sonora	22	5	3.2	11.2	4
Santa Cruz Island	20.7	5.3	3	11.1	3.9
Espiritu Santo Island	17.7	4.3	3.2	9.8	3.7
♀					
Guaymas, Sonora	28.3[2]	6.1	3.6	13.4	4.7
Guaymas, Sonora	27.8[3]	6.3	4.8	13.8	4.8
Guaymas, Sonora	26.6	6.7	4.2	14.2	5
Mejia Island	28	6.4	4	13.3	4
La Paz, Lower California	25[4]	6.7	3.1	14	4.7
La Paz, Lower California	27	6.3	4.1	13.5	4.7

The caudal tibiæ are seen to be jasper red or russian blue in the adults. In immature individuals they are pale brown, in a number of cases darkened distad, with dorsal surface there blackish brown.

TETTIGONIIDÆ

26. Insara psaronota[5] Hebard, new species

Figs. 4 and 5, p. 329

The present insect is nearest the Lower Californian *I. lamellata* Rehn & Hebard. From the type of that insect, a female,

[2] Moderately distended.
[3] Slightly distended.
[4] Shrunken.
[5] In allusion to the dappled gray dorsal surface of the tegmina in this species.

females of *psaronota* differ in the less strongly lamellate ventro-cephalic margins of the cephalic and median femora distad, ovipositor which is much more suddenly recurved and thus of the form more usual in the species of the genus, in the longer organs of flight and not striking, but distinctive, color pattern.

The vertex has the dorsal surface of the fastigium declivent, this more decided in median section, but individually variable in degree. The same is true for *lamellata* and our present examination convinces us that the vertex in these species is really closer to that of *Brachyinsara magdalenæ* Rehn & Hebard than that of *Insara elegans* (Scudder).

The male before us shows further convergence toward Brachyinsara in the strongly and broadly produced ultimate tergite, which completely conceals the supra-anal plate and agrees closely with that of the male of *magdalenæ*. That genus is readily recognized, however, by its decidedly more robust form, distinctively shaped pronotum and rudimentary organs of flight.

Type: Male, No. 1241, Mus. Calif. Acad. Sci., collected by Jos. C. Chamberlin, June 18, 1921, at **Coyote Bay in Concepcion Bay, Lower California.**

Size medium, form moderately robust but less heavy than in *lamellata*. Head and eyes much as in that species, as discussed above. Pronotum as in *lamellata* (except that the humeral sinus in the present male is weak, as in females of that species, stronger than in females of *psaronota*); dorsum deplanate, lateral margins weakly defined cephalad, thence subcarinulate but not raised above plane of dorsum, straight, convergent caudad in slightly more than cephalic fifth, then with a rounded obtuse-angulation weakly concavo-divergent for an equal distance, in remaining portion gently divergent with a slight concavity apparent, caudal margin broadly convex; lateral lobes appreciably longer than deep. Tegmina rather broad for genus, extending caudad nearly to apices of caudal femora, stridulating area normal for genus. Wings extending caudad well beyond apices of caudal femora. Distal abdominal tergites, except last two, produced dorso-mesad in minute, acute, raised projections as in *lamellata* and *Brachyinsara magdalenæ;* penultimate tergite simple. Ultimate tergite deeply sulcate medio-longitudinally, produced above cerci in a transverse, rounded trapezoidal plate, the median impression so extensive that the tergite appears bilobate. Supra-anal plate not visible. Cerci short, rather strongly incurved, crassate, cylindrical, hardly tapering to the flattened apex which is toothed, this tooth directed meso-distad at an angle; as in *Brachyinsara magdalenæ*. Subgenital plate very short and broad, lateral margins convex-convergent distad and produced in very minute, styliform appendages disto-laterad, between which the distal margin is weakly and bluntly obtuse-angulate produced with sides of

this angulation slightly concave. Cephalic and median femora with ventro-cephalic margins becoming weakly lamellate distad, this slightly stronger than in *Brachyinsara magdalenæ,* much weaker than in *lamellata,* there armed with (0 to 2, normally 1) spines. Genicular lobes of cephalic and median femora bispinose; of caudal femora strongly acute-angulate produced, unspined.

Allotype: Female, No. 1242, Mus. Calif. Acad. Sci., from San Marcos Island, Gulf of California, Lower California, Mexico. June 19, 1921. (E. P. Van Duzee).

Agrees closely with male, differing as follows: Form very slightly more attenuate; tegmina with marginal field narrowing more gradually distad; ovipositor shorter than cephalic femur, bent sharply upward at base, rounding distad to the angulate but not produced apex; bent portion of dorsal margin and distal portion of ventral margin finely serrulate; subgenital plate triangular with lateral margins weakly convex to the blunt apex, length approximately basal width, surface medio-longitudinally strongly impressed in proximal portion.

MEASUREMENTS (IN MILLIMETERS)

♂	Length of body	Length of pronotum	Caudal width of pronotal disk	Length of tegmen	Length of caudal femur	Length of ovipositor
Coyote Bay. *Type*.....	16	4	2.8	21	21	..
♀						
San Pedro Bay. *Paratype*.....	18	4.2	3	23.1	23.9	5.1
San Marcos Island. *Allotype*..	16	3.8	2.7	21.8	20	4.9
San Marcos Island. *Paratype*..	16	3.9	2.7	20	19.8	4.8
San Nicolas Bay. *Paratype*....	..	4.1	2.9	24	22	5

The San Pedro Bay and San Nicolas Bay individuals, though showing distinct elongation of body, organs of flight and limbs, clearly represent the same species.

Coloration: Male. *Type.* Lumiere green, except as follows: abdomen and limbs distad apparently discolored, buffy. Head with occiput clay-color, laterad deepening irregularly to sepia; eyes verona brown; disk of pronotum washed with clay color; stridulating field of tegmina vinaceuos-buff, suffused proximo-laterad on each side with clove brown, narrow remainder of anal field to apex of tegmina vinaceous-buff, with minute veins darkened, giving a faintly streaked appearance.

Female. *Allotype.* General coloration light gray, body showing a weak tinge of brown, pronotal disk finely margined laterad with black. Tegmina with delicate black markings in a weak herring-bone pattern. Antennæ moderately annulate distad. The other females are brown or yellowish green, with dorsal surface, particularly of the tegmina, grayish, the tegmina in that area faintly streaked with darker.

Specimens examined: 5; 1 male, 4 females.

San Pedro Bay, Sonora, Mexico, July 7, 1921, (E. P. Van Duzee), 1 ♀, *paratype.*

San Marcos Island, Gulf of California, June 19, 1921, (Van Duzee; Owen), 2 ♀, *paratypes.*

Coyote Bay in Concepcion Bay, Lower California, June 18, 1921, (J. C. Chamberlin), 1 ♂, *type.*

San Nicolas Bay, Lower California, May 17, 1921, (V. Owen), 1 ♀, *paratype.*

27. **Phaneroptera**[6] **mexicana** Saussure

Mulegé, Lower California, May 14, 2 juv. ♂.

This insect is found in the United States only very near the Mexican Border, from the Chisos Mountains in Texas to the Pacific. It has been recorded from a number of Mexican localities as the synonymous *furculata* of Brunner, its distribution extending far southward in that country.

28. **Microcentrum**[7] **suave** Hebard, new species

Figs. 6, 7, 8 and 9, p. 329

This insect, when compared with *M. retinerve* (Burmeister), is found to differ in the smaller size, narrower tegmina, with male stridulating field much smaller and immaculate, male cerci more elongate and differently armed, male subgenital plate differently emarginate distad and more widely separated, shorter styles. In the female of *suave,* the ovipositor differs in not having the disto-ventral portion curving broadly distad nor the armed distal margin oblique as in *retinerve.*

Type: Male, No. 860, Hebard collection, collected by J. A. Kurche, December 16-31, 1916, at **Mazatlan, Sinaloa, Mexico.**

Size small, form slender for the genus. Head much as in *retinerve,* with occiput very weakly convex, vertex declivent, longitudinally faintly subsulcate mesad, with width at transverse sulcus (separating it from

[6] This name takes the place of Scudderia, the latter falling as a synonym, due to the recent genotypic designation made by Caudell.

[7] The Mexican material of this genus, treated in the Biologia Centrali-Americana, is clearly in great need of revision. We find that *M. retinerve* (Burmeister) is a species peculiar to the eastern United States and not occurring anywhere in Mexico. The insect here treated belongs to a distinct, though related, group.

frontal fastigium) distinctly less than twice that of proximal antennal joint. Pronotum smooth, disk with cephalic margin broadly concave, showing an almost obsolete median production (very much weaker than normal in *M. rhombifolium* (Saussure)), caudal margin evenly convex, lateral margins rounding strongly into the vertical lateral lobes, which are much deeper than long, with humeral sinus deep. Tegmina widest slightly beyond apex of the comparatively small and immaculate stridulating area, narrowing gradually thence to the rounded apex, well surpassed by the wings, veins of marginal field in no way thickened or specialized toward costal margin. Ultimate tergite truncate. Supra-anal plate vertical, simple. Cerci very elongate, cylindrical, slender, tapering slightly and incurved with apices rounded, armed dorsad before the apex with a flattened, chisel-shaped tooth, directed parallel to the shaft with apex extending an equal distance distad. Subgenital plate trisulcate, its apex truncate on each side, rectangulate-emarginate mesad. The truncate disto-lateral apices thus formed each surmounted by a small, simple style, hardly over three times as long as broad. Ventral femoral margins armed with minute spines (in the series as follows: cephalic internal 2 to 3, cephalic external 0, median internal 0, median external 2 to 3, caudal internal 6 to 8, caudal external 5 to 9.)

Allotype: Female, Tepic, Tepic, Mexico. [Hebard Collection.]

Very similar to male, differing as follows: Size larger, form more robust. Tegmina broader and showing somewhat greater narrowing beyond proximal portion. Ovipositor very small, curved suddenly and moderately strongly dorsad in proximal portion; dorsal valves with dorsal margin rounding evenly to apex, armed distad with minute teeth which in distal portion are elongate; ventral valves unarmed to disto-ventral angle, which is sharply rounded-rectangulate, the short distal margin transverse and armed with elongate teeth, of which the dorsal is decidedly the longest. Subgenital plate small, triangular, embracing base of ovipositor, with apex blunt.

MEASUREMENTS (IN MILLIMETERS)

♀	Length of body	Length of pronotum	Length of tegmen	Greatest width of tegmen	Length of caudal femur	Length of ovipositor
Mazatlan, Sinaloa. *Type*...	17.5[8]	5	35	8.8	20.1	..
Tepic, Tepic. *Paratype*.....	20.2	5.7	37	8.9	21.2	..
♀						
Guaymas, Sonora. *Paratype*	20.5[8]	5	39.8	12	21.4	5
Tepic, Tepic. *Allotype*.....	20[8]	5.7	37.1	11.9	19.7	4.8
Tepic, Tepic. *Paratype*.....	23	5.8	38.4	11.8	23	4.9

General coloration courge green, approaching light cendre green on body. Stridulating field of male tegmina immaculate. Eyes dresden brown. Enlarged proximal portion of cephalic tibiæ buffy overlaid with

[8] The body of this specimen is shrivelled.

vinaceous, the tympana themselves with a blackish line and those of the caudal surfaces with a suffusion dorsad of the same.

Specimens examined: 5; 2 males and 3 females.

Guaymas, Sonora, Mexico, April 7, 1921, (E. P. Van Duzee), 1 ♀, *paratype.*

Mazatlan, Sinaloa, Mexico, December 16 to 31, 1916, (J. A. Kusche), 1 ♂, *type,* [Hebard Cln.].

Tepic, Tepic, Mexico, 1 ♂, 2 ♀, *paratype,* [Hebard Cln.].

29. **Orchelimum unispina** (Saussure & Pictet)

San Carlos Bay, Guaymas, Sonora, July 8, 2 ♂, 1 juv. ♀; Mulegé, Lower California, May 15, 1 ♂.

The adults before us have fully developed tegmina and wings, showing no reduction. This species was previously known only from the states of Vera Cruz and Jalisco, Mexico.

30. **Eremopedes spinosa** Hebard, new species

Figs. 10, 11, 12 and 13, p. 329

This is a large species, equalling in size *E. ephippiata* (Scudder) and is readily distinguished from the known forms of Eremopedes by the conspicuous though shallow first transverse sulcus of the pronotum, the very strong humeral sinus with margin there deeply though broadly concave, the bispinose genicular lobes of the cephalic and median femora and unspined external genicular lobes of the caudal femora, the heavily spined ventral femoral margins (except the caudal of the cephalic femora), the differently specialized ultimate tergite and subgenital plate of the female and the male genitalia. The male cerci are of a type similar to that developed in *E. balli* Caudell, but decidedly more elongate and slender.

The dark marking of the male tegmina occurs only distad of the stridulating field as a broadly suffused, transverse band.

Type: Male, No. 1243, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, June 28, 1921, at **Mejia Island, Gulf of California.**

Size large for the genus, form normal. Head normal for the genus, much as in *ephippiata.* Pronotum ample, produced in caudal portion with caudal margin truncate, first transverse sulcus decided, median transverse sulcus decided only on lateral lobes, surface toward ventral

and caudal margins of lateral lobes showing a broad marginal angulation; lateral lobes deep, ventral margin nearly horizontal, entire caudal margin decidedly, though broadly concave, so that the lateral lobes are roughly trapezoidal. Tegmina projecting briefly beyond pronotum, stridulating area covered by caudal production of disk, surfaces weakly convex, caudal margins broadly rounded. Prosternum unarmed. Ultimate tergite produced in two spiniform processes which are slightly divergent and faintly decurved, slightly shorter than the width between their apices. Cerci cylindrical, nearly straight, internally with a truncate projection at base of distal third, this projection armed from near proximal portion to distal angle with rough denticulations, distal third of cercus one and one-half times as long as the projection, tapering to the bluntly rounded apex. Subgenital plate with two heavy rounded carinæ which weakly converge distad, to the base of the small styles, which are separated a distance slightly longer than one of them, the caudal margin of the subgenital plate in this interval concave. Internal genicular lobes of caudal femora unispinose, others as described above. Ventral femoral margins armed with spines (in the series, as follows: cephalic internal 3 to 5, cephalic external 0, median internal 2 to 5, median external 3 to 6, caudal internal 5 to 9, caudal external 5 to 9). Cephalic tibiæ with dorso-caudal margin armed with a proximal, median and apical spine.

Allotype: Female, No. 1244, Mus. Calif. Acad Sci., same data as type.

Agrees closely with male, differing as follows: Size slightly larger. Tegmina small, vestigial, lateral pads, concealed by pronotum. Ultimate tergite medio-longitudinally sulcate and with caudal margin produced in two minute, acute projections above each side of the very small supra-anal plate. Ovipositor elongate, weakly curved dorsad, base stout, apex very sharply acute, the dorsal valves with a medio-longitudinal, linear carina only near apex itself. Subgenital plate heavy, embracing base of ovipositor, truncato-lobate on each side, distal margin transverse and broadly concave.

MEASUREMENTS (IN MILLIMETERS)

♂	Length of body	Length of pronotum	Caudal width of pronotum	Total length of tegmen	Length of caudal femur	Length of ovipositor
Mejia Island. *Type*.....	25	8.7	5	5.8	24	..
♀						
Mejia Island. *Allotype*.....	26.2	9	5.4	..	24.2	19
Mejia Island. *Paratype*.....	30.8[9]	8.9	5.2	..	25.7	18.8
Mejia Island. *Paratype*.....	25	8.8	5.1	2.2	23.4	19.8
Pond Island Bay. *Paratype*..	24	9	5.2	..	26.6	21

The antennæ are exceedingly long, in the type 62, in the allotype 73 mm.

[9] Body squeezed out.

General coloration sayal brown, apparently immaculate except for a weakly darker suffusion on the apices of the caudal femora, preceded by a weakly paler area, and a weakly darker suffusion of the bases of the caudal tibiæ. The tarsal joints are light ochraceous-buff, with lobes of penultimate joint heavily suffused with blackish brown. Tegmina of male cinnamon-buff, with a broad blackish, irregular, transverse suffusion across their distal portion beyond the stridulating area.

Specimens examined: 6; 1 male, 4 females and 1 immature individual.

Mejia Island, Gulf of California, June 30, 1921 (J. C. Chamberlin), 1 juv. ♀; June 28, 1921 (E. P. Van Duzee), 1 ♂, 3 ♀, *type, allotype* and *paratypes;* Pond Island Bay, Angel de la Guardia Island, Gulf of California, June 30, 1921, (E. P. Van Duzee), 1 ♀, *paratype.*

GRYLLIDÆ

31. **Cryptoptilum hesperum** Rehn & Hebard

San Carlos Bay, Sonora, July 8, 1 ♀.

This insect was hitherto known only from Lower California.

32. **Hoplosphyrum boreale** (Scudder)

San Pedro Bay, Sonora, July 7, 1.

The present species is known from numerous localities in the southwestern United States and from Lower California.

33. **Nemobius cubensis mormonius** Scudder

San Carlos Bay, Sonora, Mexico, July 9, 1 ♂; Mulegé, Lower California, May 14, 1 ♀.

This cricket is widely distributed over the southwestern United States and northern Mexico, being known from the latter country as far south as the state of Tabasco.

34. **Gryllus assimilis** (Fabricius)

Georges Island, Gulf of California, April 26, (J. C. Chamberlin), 1 ♂; Angeles Bay, Lower California, May 5, 1 ♀; Loreto, Lower California, May 20, 1 ♀.

This common field cricket is found almost everywhere in America where Orthoptera occur.

35. **Œcanthus californicus** Saussure

Espiritu Santo Island, Gulf of California, June 9, 1 ♂ ; San Pedro Bay, Sonora, July 7, 2 ♀ ; Sierra El Taste, Lower California, 3 ♂, 4 ♀, [Hebard Cln.] ; San Lazaro, Lower California, 1 juv. ♀.

Considerable confusion still exists in the nomenclature of this genus and the distribution of the present species can, in consequence, not be definitely stated. It appears to be the most abundant species of Œcanthus in the regions surrounding the Gulf of California and occurs also in New Mexico, Arizona and California.